



# INDICES OF THE PHYSICAL VOLUME OF MINING PRODUCTION

No: 2015/1

## STATS BRIEF FOURTH QUARTER 2014 STATISTICS BOTSWANA

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## 1.0 Preface

This statistical release presents quarterly Indices of Mining Production (IMP) for the period 2003 to the fourth quarter of 2014. Also carried in the report is the annual IMP for the period 2003 to 2014 (derived as the average of 4 quarters of the year). This report uses 2013 as a reference/base year. Data used in this publication is sourced from the Department of Mines, which is a department in the Ministry of Minerals, Energy and Water Resources.

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We sincerely thank all stakeholders involved in the formulation of this brief, for their continued support, as we strive to better serve users of our services.



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April 2015

## 2.0 Summary of Findings

Table 1 presents key figures on the summary of findings for IMP as at the fourth quarter of 2014. This table forms the basis of the discussion under sub-section 2.1. Reference however, will be made to this table and other tables throughout the report.

**Table 1: Key Figures in the Volume of Mining Production**

	Second Quarter 2013	Third Quarter 2013	Fourth Quarter 2013	First Quarter 2014	Second Quarter 2014	Third Quarter 2014	Fourth Quarter 2014
Index of the physical volume of mining production	111.6	97.1	108.8	96.2	106.6	105.7	104.5
Year-on-year percentage change, seasonal unadjusted	25.2	38.4	19.1	16.7	(4.5)	8.9	(4.0)
Quarter-on-Quarter percentage change, seasonal unadjusted	35.3	(12.9)	12.0	(11.5)	10.8	(0.8)	(1.2)

() denote negative figures

### 2.1 Indices of Mining Production

At the end of fourth quarter of 2014, IMP stood at 104.5 showing a negative year-on-year growth of 4.0 percent (see Tables 1, 2, 4 and 5). The negative growth rates recorded was for Gold (49.1 percent) and diamonds (5.7 percent). The significant contributor to the 4.0 percent decrease was Diamonds, contributing negative 4.8 percentage points. Copper in concentrates (contributing 0.6 of a percentage point), Copper-Nickel-Cobalt matte and Soda Ash (each contributing 0.4 of a percentage points) were the main positive contributions to the fall in mining production. However, their positive contributions were too small to offset the negative contribution brought by diamonds (refer to tables 2 & 6).

On annual basis, the total index of mining production increased by 3.3 percent in 2014 as compared to 17.3 percent in the previous year. This was mainly due to the slow growth in diamond production which increased by 6.6 percent in 2014 compared to an increase of 12.2 percent registered in 2013. The deceleration in the total index mining production was also affected by a decrease in the production of Copper-Nickel-Cobalt matte (refer to table 5)

Although the total index of mining production growth increased in most parts of the period 2004 to 2014, it decreased at an average annual rate of 1.5 percent during the last ten (10) years, as indicated in Table 3.

### 2.2 Mineral Production

Discussions on mineral production, which compare production during the fourth quarter of 2014 to the same quarter of 2013, are based on Tables 2 and 5.

Diamond production declined 5.7 percent in the fourth quarter of 2014, when compared with the same quarter of the previous year. This decline is attributable to mining of lower grade ore from the key operating mines.

Copper-Nickel-Cobalt matte production recovered in the fourth quarter of 2014, increasing by 5.0 percent after recording declines for three consecutive quarters.

Copper in concentrates production decelerated, increasing 11.4 percent in the fourth quarter of 2014 after increasing 165.9 percent in the corresponding quarter of 2013, this was attributable to the insufficient ore supply to the mill from plant and low ore production which was aggravated by the wet conditions.

Gold production exhibited the largest decline, at 49.1 percent in the fourth quarter of 2014. This was attributable to low ore mined which resulted in low gold recoveries from the ore.

Soda Ash production exhibited the highest growth, at 72.2 percent in the fourth quarter of 2014. The substantial increase was the result of the necessity to stockpile ahead of a scheduled shutdown to allow for refurbishment of machinery during the first quarter of 2015.

Salt production rose significantly during the fourth quarter of 2014, increasing by 62.3 percent after declining for four consecutive quarters

Silver production increased by 35.9 percent. The increase was largely attributable to higher than expected ore crushed and recoveries which has successively augmented production.

Coal production increased by 4.0 percent in the fourth quarter of 2014 as compared to a decline of 29.4 percent in the corresponding quarter of 2013. This can be attributed to demand from Botswana Power Cooperation and increased exportation of coal during the period under review.

**Table 2: Index of Mining Production for the latest Quarter (Q4 of 2014) by Mineral Groups and Minerals**

Base:2013=100					
	Weights(2013)	Fourth Quarter 2013	Fourth Quarter 2014	Year-on-Year Percentage Change	contribution (% points) to the percentage change in the total mining production
Diamonds	82.5	111.9	105.5	(5.7)	(4.8)
Copper-Nickel-Cobalt Matte	8.6	91.9	96.5	5.0	0.4
Copper Concentrates	5.5	97.4	108.5	11.4	0.6
Gold	1.4	122.5	62.3	(49.1)	(0.8)
Soda Ash	0.9	75.2	129.5	72.2	0.4
Salt	0.5	67.6	109.7	62.3	0.2
Silver	0.4	71.7	97.5	35.9	0.1
Coal	0.3	104.1	108.3	4.0	0.0
<b>Total</b>	<b>100.0</b>	<b>108.8</b>	<b>104.2</b>	<b>(4.0)</b>	<b>(4.0)</b>

NB: The contribution (percentage points) of a mineral to the percentage change in the total mining production is calculated by multiplying the difference in the index for the mineral by the weight of the mineral and then dividing by the previous period's total index.  
( ) denote negative figures

**Table 3: Index of Mining Production Annualized Growth Rate by Mineral Group**

Mineral Group	Annualized Growth Rates
Diamonds	(2.3)
Copper-Nickel-Cobalt Matte	(3.9)
Copper in Concentrate	...
Gold	...
Soda Ash	0.1
Salt	9.0
Silver	...
Coal	6.5
<b>Total</b>	<b>(1.5)</b>

( ) denote negative numbers

n. a signifies data not available/no production at the period.

...data is not zero but the figure is not large enough to be measured

**Table 4: Index of the Volume of Mining Production by Mineral Group and Mineral**

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	82.5	8.6	5.5	1.4	0.9	0.5	0.4	0.3	100.0
<b>2003</b>	131.3	117.1	n.a.	n.a.	102.8	44.0	n.a.	55.0	<b>119.6</b>
<b>2004</b>	134.2	99.4	n.a.	n.a.	116.1	41.6	n.a.	60.9	<b>120.6</b>
<b>2005</b>	137.6	133.7	n.a.	268.1	123.7	37.7	n.a.	65.8	<b>130.1</b>
<b>2006</b>	148.2	126.6	n.a.	250.4	104.8	40.0	n.a.	64.3	<b>137.9</b>
<b>2007</b>	145.4	111.4	n.a.	220.0	122.7	50.4	n.a.	55.4	<b>134.0</b>
<b>2008</b>	140.9	118.1	n.a.	263.2	115.6	32.8	n.a.	60.8	<b>131.3</b>
<b>2009</b>	76.7	121.1	n.a.	134.7	93.0	45.5	n.a.	49.3	<b>76.7</b>
<b>2010</b>	95.2	110.7	12.5	147.0	105.7	70.0	n.a.	66.1	<b>92.2</b>
<b>2011</b>	99.0	71.9	22.1	129.4	113.1	85.7	n.a.	52.7	<b>92.4</b>
<b>2012</b>	89.1	80.5	31.1	114.1	109.1	70.5	n.a.	97.2	<b>85.3</b>
<b>2013</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	<b>100.0</b>
<b>2014</b>	106.6	67.1	114.0	79.4	117.8	98.9	98.6	114.4	<b>103.3</b>
<b>2003 Q1</b>	102.3	67.7	n.a.	n.a.	98.4	40.3	n.a.	51.6	<b>91.3</b>
<b>Q2</b>	134.6	143.4	n.a.	n.a.	111.0	50.4	n.a.	61.6	<b>124.7</b>
<b>Q3</b>	149.6	137.2	n.a.	n.a.	103.7	50.3	n.a.	59.8	<b>136.5</b>
<b>Q4</b>	138.7	120.0	n.a.	n.a.	97.9	35.1	n.a.	47.0	<b>125.8</b>
<b>2004 Q1</b>	99.9	133.3	n.a.	n.a.	90.3	39.2	n.a.	55.2	<b>95.0</b>
<b>Q2</b>	108.5	78.6	n.a.	n.a.	102.7	49.4	n.a.	60.7	<b>97.5</b>
<b>Q3</b>	166.1	43.8	n.a.	n.a.	128.8	37.9	n.a.	61.7	<b>142.3</b>
<b>Q4</b>	162.1	142.0	n.a.	n.a.	142.8	39.9	n.a.	66.0	<b>147.5</b>
<b>2005 Q1</b>	123.0	142.5	n.a.	304.3	132.7	43.2	n.a.	64.6	<b>119.5</b>
<b>Q2</b>	141.2	133.1	n.a.	352.6	108.7	33.2	n.a.	60.8	<b>134.0</b>
<b>Q3</b>	141.0	135.5	n.a.	215.4	130.7	36.9	n.a.	66.1	<b>132.4</b>
<b>Q4</b>	145.3	123.8	n.a.	200.1	122.8	37.5	n.a.	71.9	<b>134.7</b>
<b>2006 Q1</b>	143.8	115.5	n.a.	230.7	74.9	29.7	n.a.	66.9	<b>132.7</b>
<b>Q2</b>	136.8	131.1	n.a.	261.9	113.7	41.9	n.a.	67.4	<b>129.1</b>
<b>Q3</b>	154.1	136.1	n.a.	260.2	138.6	56.4	n.a.	59.9	<b>144.0</b>
<b>Q4</b>	158.3	123.8	n.a.	248.6	92.2	31.9	n.a.	63.2	<b>145.8</b>

**Table 4 continued ... Index of the Volume of Mining Production by Mineral Group and Mineral**

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	82.5	8.6	5.5	1.4	0.9	0.5	0.4	0.3	100
<b>2007 Q1</b>	141.9	123.6	n.a.	174	100.4	14.8	n.a.	59.4	<b>131.2</b>
<b>Q2</b>	141.8	128.2	n.a.	249.6	122.4	56.4	n.a.	56	<b>133</b>
<b>Q3</b>	157.8	44.9	n.a.	228.4	147.3	70.3	n.a.	57.5	<b>139</b>
<b>Q4</b>	140.1	149.1	n.a.	228.1	120.6	60.1	n.a.	48.7	<b>133</b>
<b>2008 Q1</b>	140.7	130	n.a.	217	113.8	31.3	n.a.	61.3	<b>131.6</b>
<b>Q2</b>	138.9	111.2	n.a.	257.6	100.7	21.1	n.a.	59.3	<b>128.8</b>
<b>Q3</b>	158	124.3	n.a.	266.4	123.5	44.3	n.a.	62	<b>146.2</b>
<b>Q4</b>	126	106.8	n.a.	311.7	124.5	34.5	n.a.	60.7	<b>118.8</b>
<b>2009 Q1</b>	n.a	92.5	n.a.	140.2	86.7	43.4	n.a.	58.7	<b>11</b>
<b>Q2</b>	67.7	131	n.a.	155.5	67.4	32.6	n.a.	50.2	<b>70.1</b>
<b>Q3</b>	101.3	136.9	n.a.	133.8	116.8	43.5	n.a.	45.6	<b>98.5</b>
<b>Q4</b>	137.7	123.9	n.a.	109.4	101.2	62.7	n.a.	42.8	<b>127</b>
<b>2010 Q1</b>	79.4	127.4	6.1	134.7	103.7	58.5	n.a.	63.4	<b>80</b>
<b>Q2</b>	98.1	81.8	10.5	135	91.2	56.7	n.a.	63.8	<b>91.6</b>
<b>Q3</b>	103.5	134.1	16.8	160.9	109.8	95.8	n.a.	71.9	<b>101.7</b>
<b>Q4</b>	99.7	99.7	18.6	157.6	118	68.9	n.a.	65.2	<b>95.5</b>
<b>2011 Q1</b>	93.3	95.2	15.7	111.1	98.7	71.8	n.a.	55.6	<b>88.9</b>
<b>Q2</b>	102.5	85.9	23.8	111.8	101.6	69.5	n.a.	72.4	<b>96.2</b>
<b>Q3</b>	119.8	7.2	25.8	134.3	130.9	106.5	n.a.	56.9	<b>104.6</b>
<b>Q4</b>	80.3	99.3	23.1	160.4	121.4	94.7	n.a.	25.8	<b>79.9</b>
<b>2012 Q1</b>	92.5	110.1	23.8	134.6	105.9	65.8	n.a.	62.6	<b>90.3</b>
<b>Q2</b>	92.4	99.6	22.9	119.8	99.2	78.3	n.a.	60.1	<b>89.1</b>
<b>Q3</b>	75.8	25.6	41	108.9	129.1	58.2	n.a.	118.8	<b>70.2</b>
<b>Q4</b>	95.7	86.9	36.6	93.1	102.1	79.9	n.a.	147.4	<b>91.4</b>
<b>2013 Q1</b>	80.5	88	94	76.6	122.9	97	102.3	107.5	<b>82.5</b>
<b>Q2</b>	111.7	112.4	115.5	98.5	89	116.8	118.1	74.6	<b>111.6</b>
<b>Q3</b>	95.8	107.8	93.2	102.4	112.9	118.6	108	113.8	<b>97.1</b>
<b>Q4</b>	111.9	91.9	97.4	122.5	75.2	67.6	71.7	104.1	<b>108.8</b>
<b>2014 Q1</b>	101.5	46.8	96.9	96.4	109	68.6	73.2	95	<b>96.2</b>
<b>Q2</b>	110	73.4	114.7	74.3	115.6	100.8	88.5	123.9	<b>106.6</b>
<b>Q3</b>	109.3	51.6	136	84.5	117.3	119.5	135.4	130.6	<b>105.8</b>
<b>Q4</b>	105.5	96.5	108.5	62.3	129.5	109.7	97.5	108.3	<b>104.5</b>

**NB:**

1. n.a signifies data not available/no production at the specified period,
2. ...data is not zero but the figure is not large enough to be measured

**Table 5: Year-on-Year Percentage Change in the Volume of Mining Production by Mineral Group and Mineral**

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
<b>Weights</b>	<b>82.5</b>	<b>8.6</b>	<b>5.5</b>	<b>1.4</b>	<b>0.9</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>100.0</b>
<b>2004</b>	2.2	(15.1)	n.a.	n.a.	13.0	(5.5)	n.a.	10.7	0.8
<b>2005</b>	2.6	34.5	n.a.	...	6.5	(9.4)	n.a.	8.1	7.9
<b>2006</b>	7.7	(5.3)	n.a.	(6.6)	(15.3)	6.1	n.a.	(2.3)	6.0
<b>2007</b>	(1.9)	(12.0)	n.a.	(12.1)	17.0	26.1	n.a.	(14.0)	(2.8)
<b>2008</b>	(3.1)	6.0	n.a.	19.6	(5.7)	(34.9)	n.a.	9.8	(2.0)
<b>2009</b>	(45.6)	2.5	n.a.	(48.8)	(19.6)	38.8	n.a.	(18.9)	(41.6)
<b>2010</b>	24.2	(8.5)	n.a.	9.1	13.6	53.6	n.a.	33.9	20.3
<b>2011</b>	4.0	(35.1)	76.5	(12.0)	7.0	22.4	n.a.	(20.3)	0.2
<b>2012</b>	(10.0)	12.0	40.6	(11.8)	(3.6)	(17.6)	n.a.	84.7	(7.7)
<b>2013</b>	12.2	24.2	221.9	(12.4)	(8.3)	41.8	...	2.8	17.3
<b>2014</b>	6.6	(32.9)	14.0	(20.6)	17.8	(1.1)	(1.4)	14.4	3.3
<b>2004 Q1</b>	(2.3)	96.8	n.a.	...	(8.3)	(2.8)	n.a.	6.8	4.0
<b>Q2</b>	(19.4)	(45.2)	n.a.	...	(7.5)	(2.1)	n.a.	(1.4)	(21.8)
<b>Q3</b>	11.0	(68.1)	n.a.	...	24.2	(24.6)	n.a.	(3.2)	4.2
<b>Q4</b>	16.9	18.3	n.a.	...	45.8	13.8	n.a.	40.5	17.2
<b>2005 Q1</b>	23.1	7.0	n.a.	...	46.9	10.3	n.a.	17.1	25.8
<b>Q2</b>	30.1	69.3	n.a.	...	5.9	(32.8)	n.a.	0.2	37.4
<b>Q3</b>	(15.1)	209.2	n.a.	...	1.5	(2.7)	n.a.	7.1	(6.9)
<b>Q4</b>	(10.4)	(12.9)	n.a.	...	(14.0)	(6.1)	n.a.	8.9	(8.7)
<b>2006 Q1</b>	16.9	(19.0)	n.a.	(24.2)	(43.6)	(31.4)	n.a.	3.7	11.1
<b>Q2</b>	(3.1)	(1.5)	n.a.	(25.7)	4.6	26.4	n.a.	10.7	(3.7)
<b>Q3</b>	9.3	0.5	n.a.	20.8	6.0	53.0	n.a.	(9.3)	8.8
<b>Q4</b>	9.0	0.0	n.a.	24.2	(24.9)	(14.8)	n.a.	(12.1)	8.2
<b>2007 Q1</b>	(1.3)	7.0	n.a.	(24.6)	34.1	(50.2)	n.a.	(11.3)	(1.2)
<b>Q2</b>	3.7	(2.2)	n.a.	(4.7)	7.7	34.6	n.a.	(16.9)	3.0
<b>Q3</b>	2.4	(67.0)	n.a.	(12.2)	6.3	24.8	n.a.	(4.1)	(3.5)
<b>Q4</b>	(11.5)	20.4	n.a.	(8.3)	30.8	88.3	n.a.	(22.9)	(8.8)



**Table 5 continued... Year-on-Year Percentage Change in the Volume of Mining Production by Mineral Group and Mineral**

<b>(Base 2013 = 100)</b>									
	<b>Diamonds</b>	<b>Copper-Nickel-Cobalt Matte</b>	<b>Copper Concentrates</b>	<b>Gold</b>	<b>Soda Ash</b>	<b>Salt</b>	<b>Silver</b>	<b>Coal</b>	<b>Total Index</b>
<b>Weights</b>	<b>82.5</b>	<b>8.6</b>	<b>5.5</b>	<b>1.4</b>	<b>0.9</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>100</b>
<b>2008 Q1</b>	<b>(0.8)</b>	5.2	n.a.	24.7	13.4	111.8	n.a.	3.2	<b>0.3</b>
<b>Q2</b>	<b>(2.1)</b>	<b>(13.2)</b>	n.a.	3.2	<b>(17.7)</b>	<b>(62.6)</b>	n.a.	6	<b>(3.1)</b>
<b>Q3</b>	0.1	176.9	n.a.	16.6	<b>(16.2)</b>	<b>(37.0)</b>	n.a.	7.9	<b>5.1</b>
<b>Q4</b>	<b>(10.0)</b>	<b>(28.3)</b>	n.a.	36.7	3.2	<b>(42.6)</b>	n.a.	24.6	<b>(10.6)</b>
<b>2009 Q1</b>	<b>(100.0)</b>	<b>(28.9)</b>	n.a.	<b>(35.4)</b>	<b>(23.8)</b>	38.7	n.a.	<b>(4.1)</b>	<b>(91.6)</b>
<b>Q2</b>	<b>(51.3)</b>	17.7	n.a.	<b>(39.6)</b>	<b>(33.1)</b>	54.6	n.a.	<b>(15.4)</b>	<b>(45.6)</b>
<b>Q3</b>	<b>(35.9)</b>	10.2	n.a.	<b>(49.8)</b>	<b>(5.5)</b>	<b>(1.8)</b>	n.a.	<b>(26.4)</b>	<b>(32.6)</b>
<b>Q4</b>	9.3	16	n.a.	<b>(64.9)</b>	<b>(18.7)</b>	81.6	n.a.	<b>(29.5)</b>	<b>6.9</b>
<b>2010 Q1</b>	...	37.8	...	<b>(3.9)</b>	19.6	34.8	n.a.	7.9	<b>626.4</b>
<b>Q2</b>	44.9	<b>(37.5)</b>	...	<b>(13.2)</b>	35.4	73.9	n.a.	27.2	<b>30.6</b>
<b>Q3</b>	2.2	<b>(2.1)</b>	...	20.2	<b>(5.9)</b>	120.3	n.a.	57.6	<b>3.2</b>
<b>Q4</b>	<b>(27.6)</b>	<b>(21.8)</b>	...	44	16.6	9.9	n.a.	52.4	<b>(24.8)</b>
<b>2011 Q1</b>	17.5	<b>(25.3)</b>	158.6	<b>(17.5)</b>	<b>(4.8)</b>	22.8	n.a.	<b>(12.3)</b>	<b>11.1</b>
<b>Q2</b>	4.5	5	126.7	<b>(17.2)</b>	11.3	22.5	n.a.	13.4	<b>5</b>
<b>Q3</b>	15.8	<b>(94.6)</b>	53.2	<b>(16.5)</b>	19.1	11.3	n.a.	<b>(20.9)</b>	<b>2.9</b>
<b>Q4</b>	<b>(19.4)</b>	<b>(0.4)</b>	24.6	1.7	2.8	37.5	n.a.	<b>(60.4)</b>	<b>(16.4)</b>
<b>2012 Q1</b>	<b>(0.8)</b>	15.6	51.4	21.1	7.3	<b>(8.4)</b>	n.a.	12.7	<b>1.6</b>
<b>Q2</b>	<b>(9.8)</b>	15.9	<b>(3.9)</b>	7.2	<b>(2.3)</b>	12.6	n.a.	<b>(17.0)</b>	<b>(7.3)</b>
<b>Q3</b>	<b>(36.7)</b>	255.4	59.1	<b>(18.9)</b>	<b>(1.3)</b>	<b>(45.4)</b>	n.a.	109	<b>(32.9)</b>
<b>Q4</b>	19.2	<b>(12.5)</b>	58.4	<b>(42.0)</b>	<b>(15.9)</b>	<b>(15.6)</b>	n.a.	471.1	<b>14.4</b>
<b>2013 Q1</b>	<b>(13.0)</b>	<b>(20.1)</b>	294.5	<b>(43.1)</b>	16.1	47.4	...	71.6	<b>(8.7)</b>
<b>Q2</b>	20.9	12.8	405.1	<b>(17.8)</b>	<b>(10.3)</b>	49.3	...	24.1	<b>25.2</b>
<b>Q3</b>	26.4	320.7	127.4	<b>(5.9)</b>	<b>(12.6)</b>	103.7	...	<b>(4.2)</b>	<b>38.4</b>
<b>Q4</b>	16.9	5.7	165.9	31.6	<b>(26.3)</b>	<b>(15.4)</b>	...	(29.4)	<b>19.1</b>
<b>2014 Q1</b>	26	<b>(46.8)</b>	3.1	25.8	<b>(11.4)</b>	<b>(29.3)</b>	<b>(28.4)</b>	<b>(11.7)</b>	<b>16.7</b>
<b>Q2</b>	<b>(1.5)</b>	<b>(34.7)</b>	<b>(0.7)</b>	<b>(24.6)</b>	29.8	<b>(13.7)</b>	<b>(25.1)</b>	66.1	<b>(4.5)</b>
<b>Q3</b>	14.1	<b>(52.1)</b>	46	<b>(17.5)</b>	3.9	(2.0)	25.4	14.7	<b>8.9</b>
<b>Q4</b>	<b>(5.7)</b>	5.0	11.4	<b>(49.1)</b>	72.2	62.3	35.9	4.0	<b>(4.0)</b>

Note: 1. () denote negative numbers

2. ....data is not zero but the figure is not large enough to be measured

**Table 6: Contribution of each Mineral Group and Mineral to the Year-on-Year Percentage Change in the Volume of Mining Production**

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
<b>Weights</b>	<b>82.5</b>	<b>8.6</b>	<b>5.5</b>	<b>1.4</b>	<b>0.9</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>100.0</b>
<b>2004</b>	2.0	(1.3)	n.a.	...	0.1	(0.0)	n.a.	0.0	<b>0.8</b>
<b>2005</b>	2.4	2.4	n.a.	...	0.1	(0.0)	n.a.	0.0	<b>7.9</b>
<b>2006</b>	6.7	(0.5)	n.a.	(0.2)	(0.1)	0.0	n.a.	(0.0)	<b>6.0</b>
<b>2007</b>	(1.7)	(0.9)	n.a.	(0.3)	0.1	0.0	n.a.	(0.0)	<b>(2.8)</b>
<b>2008</b>	(2.8)	0.4	n.a.	0.4	(0.0)	(0.1)	n.a.	0.0	<b>(2.0)</b>
<b>2009</b>	(40.3)	0.2	n.a.	(1.4)	(0.2)	0.0	n.a.	(0.0)	<b>(41.6)</b>
<b>2010</b>	19.9	(1.2)	n.a.	0.2	0.1	0.2	n.a.	0.1	<b>20.3</b>
<b>2011</b>	3.4	(3.6)	n.a.	(0.3)	0.1	0.1	n.a.	(0.0)	<b>0.2</b>
<b>2012</b>	(8.8)	0.8	n.a.	(0.2)	(0.0)	(0.1)	n.a.	0.1	<b>(7.7)</b>
<b>2013</b>	10.5	2.0	...	(0.2)	(0.1)	0.2	...	0.0	<b>17.3</b>
<b>2014</b>	5.4	(2.8)	0.8	(0.3)	0.2	(0.0)	...	0.0	<b>3.3</b>
<b>2004 Q1</b>	(2.1)	6.1	n.a.	...	(0.1)	(0.0)	n.a.	0.0	<b>4.0</b>
<b>Q2</b>	(17.3)	(4.5)	n.a.	...	(0.1)	(0.0)	n.a.	(0.0)	<b>(21.8)</b>
<b>Q3</b>	10.0	(5.9)	n.a.	...	0.2	(0.0)	n.a.	<b>0.0</b>	<b>4.2</b>
<b>Q4</b>	15.3	1.5	n.a.	...	0.3	0.0	n.a.	0.0	<b>17.2</b>
<b>2005 Q1</b>	20.0	0.8	n.a.	...	0.4	0.0	n.a.	0.0	<b>25.8</b>
<b>Q2</b>	27.6	4.8	n.a.	...	0.1	(0.1)	n.a.	0.0	<b>37.4</b>
<b>Q3</b>	(14.6)	5.5	n.a.	...	0.0	(0.0)	n.a.	0.0	<b>(6.9)</b>
<b>Q4</b>	(9.4)	(1.1)	n.a.	...	(0.1)	(0.0)	n.a.	0.0	<b>(8.7)</b>
<b>2006 Q1</b>	14.4	(1.9)	n.a.	(0.9)	(0.4)	(0.1)	n.a.	0.0	<b>11.1</b>
<b>Q2</b>	(2.7)	(0.1)	n.a.	(0.9)	0.0	0.0	n.a.	0.0	<b>(3.7)</b>
<b>Q3</b>	8.2	0.0	n.a.	0.5	0.1	0.1	n.a.	(0.0)	<b>8.8</b>
<b>Q4</b>	8.0	0.0	n.a.	0.5	(0.2)	(0.0)	n.a.	(0.0)	<b>8.2</b>
<b>2007 Q1</b>	(1.2)	0.5	n.a.	(0.6)	0.2	(0.1)	n.a.	(0.0)	<b>(1.2)</b>
<b>Q2</b>	3.2	(0.2)	n.a.	(0.1)	0.1	0.1	n.a.	(0.0)	<b>3.0</b>
<b>Q3</b>	2.2	(5.4)	n.a.	(0.3)	0.1	0.0	n.a.	(0.0)	<b>(3.5)</b>
<b>Q4</b>	(10.3)	1.5	n.a.	(0.2)	0.2	0.1	n.a.	(0.0)	<b>(8.8)</b>

**Table 6 continued... Contribution of each Mineral Group and Mineral to the Year-on-Year Percentage Change in the Volume of Mining Production**

<b>(Base 2013 = 100)</b>									
	<b>Diamonds</b>	<b>Copper-Nickel-Cobalt Matte</b>	<b>Copper Concentrates</b>	<b>Gold</b>	<b>Soda Ash</b>	<b>Salt</b>	<b>Silver</b>	<b>Coal</b>	<b>Total Index</b>
<b>Weights</b>	<b>82.5</b>	<b>8.6</b>	<b>5.5</b>	<b>1.4</b>	<b>0.9</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>100</b>
<b>2008 Q1</b>	<b>(0.7)</b>	0.4	n.a	0.5	0.1	0.1	n.a	0.0	<b>0.3</b>
<b>Q2</b>	<b>(1.8)</b>	<b>(1.1)</b>	n.a	0.1	<b>(0.1)</b>	<b>(0.1)</b>	n.a	0.0	<b>(3.1)</b>
<b>Q3</b>	0.1	4.9	n.a	0.4	<b>(0.2)</b>	<b>(0.1)</b>	n.a	0.0	<b>5.1</b>
<b>Q4</b>	<b>(8.7)</b>	<b>(2.7)</b>	n.a	0.9	0.0	<b>(0.1)</b>	n.a	0.0	<b>(10.6)</b>
<b>2009 Q1</b>	<b>(88.2)</b>	<b>(2.4)</b>	n.a.	<b>(0.8)</b>	<b>(0.2)</b>	0.0	n.a.	<b>(0.0)</b>	<b>(91.6)</b>
<b>Q2</b>	<b>(45.6)</b>	1.3	n.a.	<b>(1.1)</b>	<b>(0.2)</b>	0.0	n.a.	<b>(0.0)</b>	<b>(45.6)</b>
<b>Q3</b>	<b>(32.0)</b>	0.7	n.a.	<b>(1.3)</b>	<b>(0.0)</b>	<b>(0.0)</b>	n.a.	<b>(0.0)</b>	<b>(32.6)</b>
<b>Q4</b>	8.1	1.2	n.a.	<b>(2.4)</b>	<b>(0.2)</b>	0.1	n.a.	<b>(0.0)</b>	<b>6.9</b>
<b>2010 Q1</b>	594.7	27.2	...	<b>(0.7)</b>	1.4	0.7	n.a.	0.1	<b>626.4</b>
<b>Q2</b>	35.7	<b>(6.0)</b>	...	<b>(0.4)</b>	0.3	0.2	n.a.	0.0	<b>30.6</b>
<b>Q3</b>	1.9	<b>(0.2)</b>	...	0.4	<b>(0.1)</b>	0.3	n.a.	0.1	<b>3.2</b>
<b>Q4</b>	<b>(24.7)</b>	<b>(1.6)</b>	...	0.5	0.1	0.0	n.a.	0.0	<b>(24.8)</b>
<b>2011 Q1</b>	14.3	<b>(3.4)</b>	0.7	<b>(0.4)</b>	<b>(0.1)</b>	0.1	n.a.	<b>(0.0)</b>	<b>11.1</b>
<b>Q2</b>	4.0	0.4	0.8	<b>(0.4)</b>	0.1	0.1	n.a.	0.0	<b>5.0</b>
<b>Q3</b>	13.2	<b>(10.7)</b>	0.5	<b>(0.4)</b>	0.2	0.1	n.a.	<b>(0.0)</b>	<b>2.9</b>
<b>Q4</b>	<b>(16.7)</b>	<b>(0.0)</b>	0.3	0.0	0.0	0.1	n.a.	<b>(0.1)</b>	<b>(16.4)</b>
<b>2012 Q1</b>	<b>(0.7)</b>	1.4	0.5	0.4	0.1	<b>(0.0)</b>	n.a.	0.0	<b>1.6</b>
<b>Q2</b>	<b>(8.6)</b>	1.2	<b>(0.1)</b>	0.1	<b>(0.0)</b>	0.0	n.a.	<b>(0.0)</b>	<b>(7.3)</b>
<b>Q3</b>	<b>(34.7)</b>	1.5	0.8	<b>(0.3)</b>	<b>(0.0)</b>	<b>(0.2)</b>	n.a.	0.1	<b>(32.9)</b>
<b>Q4</b>	15.9	<b>(1.3)</b>	0.9	<b>(1.2)</b>	<b>(0.2)</b>	<b>(0.1)</b>	n.a.	0.4	<b>14.4</b>
<b>2013 Q1</b>	<b>(11.0)</b>	<b>(2.1)</b>	4.3	<b>(0.9)</b>	0.2	0.2	...	0.1	<b>(8.7)</b>
<b>Q2</b>	17.9	1.2	5.7	<b>(0.3)</b>	<b>(0.1)</b>	0.2	...	0.0	<b>25.2</b>
<b>Q3</b>	23.5	10.0	4.1	<b>(0.1)</b>	<b>(0.2)</b>	0.4	...	<b>(0.0)</b>	<b>38.4</b>
<b>Q4</b>	14.6	0.5	3.6	0.5	<b>(0.3)</b>	<b>(0.1)</b>	...	(0.1)	<b>19.1</b>
<b>2014 Q1</b>	21.0	<b>(4.3)</b>	0.2	0.3	<b>(0.2)</b>	<b>(0.2)</b>	<b>(0.2)</b>	<b>(0.0)</b>	<b>16.7</b>
<b>Q2</b>	<b>(1.3)</b>	<b>(3.0)</b>	<b>(0.0)</b>	<b>(0.3)</b>	0.2	<b>(0.1)</b>	<b>(0.1)</b>	0.1	<b>(4.5)</b>
<b>Q3</b>	11.4	<b>(5.0)</b>	2.4	<b>(0.3)</b>	0.0	(0.0)	0.1	0.0	<b>8.9</b>
<b>Q4</b>	<b>(4.8)</b>	0.4	0.6	<b>(0.8)</b>	0.4	0.2	0.1	0.0	<b>(4.0)</b>

Note: 1. () denote negative numbers

2. ....data is not zero but the figure is not large enough to be measured

### **3.0 Technical Notes**

#### **3.1 Background Information**

Mining activity in Botswana started in the 19th century with the production of Gold by Europeans from the Tati Reefs which is now the modern Francistown area. However, much of this activity could not be accounted for, despite its significant contribution to the economy at that time. Modern mining in Botswana started with the mining of Diamonds at Orapa in 1971 followed by Copper-Nickel production in 1973 at Selibe- Phikwe. Since the early 1980s, the mining industry has been the largest contributor to real gross domestic product (GDP), contributing between 30 and 50 percent. Its value has been increasing at an annual rate of nearly 20 percent. These mineral contributions enabled the Government to undertake investments in both human and physical infrastructure development over time. In 2013, mining accounted for 22.4 percent of Botswana's GDP, and more than 50 percent of Government revenues. Even though the mining sector's contribution to GDP has been below 25 percent since the 2009 recession, available data indicates that the sector still leads in terms of value added contribution to GDP. Despite its great contribution to Botswana's GDP, the mining industry is capital intensive and accounts for less than 5 percent of employment in the private sector.

With such a significant contribution to the GDP, and or the national economy, the need for a measure of change in the production of minerals in Botswana cannot be over emphasized. The index of physical volume of mining production is such a measure that provides a relative change over time in mining production. IMP can also be used as a deflator to calculate the gross domestic product (GDP) at constant prices.

#### **3.2 Data collection**

A mining production survey is carried out by the Department of Mines at the Ministry of Minerals, Energy and Water Resources, covering all mining establishments operating in the country. After the completion of data collection, the Department of Mines through its data sharing arrangement with Statistics Botswana provides the data to Statistics Botswana. Following international standards and guidelines, Statistics Botswana cleans the data, produces statistical tables and produces reports which are then packaged and disseminated to users. The results of the survey are used to calculate the volume of mining production indices on quarterly basis and subsequently to estimate GDP, also on a quarterly basis.

#### **3.3 Scope of the survey**

The survey covers all mining establishments conducting activities relating to the extraction of minerals occurring naturally as solids such as diamonds, copper-nickel-cobalt matte, gold, copper in concentrates, soda ash, salt coal, semi-precious stones and the quarrying of building materials. The activities are classified according to the International Standard of Industrial Classification of all Economic Activities, ISIC Rev 4, and central product classification (CPC) Version 2.

#### **3.4 Concepts, definitions and methods**

The index of the volume of mining productions is a ratio that indicates the increase or decrease of a magnitude (ALLEN, 1975). The index form is used not only for intertemporal comparisons but for comparisons between countries (Bal, 2008)

The IMP is an important macro-economic indicator which monitors progress and fluctuation of the mineral sector production in the economy. The Index is also known to be an effective tool that measures current production which indicates relative changes over time in the physical volume of mining production.

#### **3.5 Base Period**

The base period, usually a year, is the period against which other periods are compared and whose values provide the weights for an index (UNSD, 2010). The base period, also referred to as reference period used in this brief is 2013 and it is set at 100.

#### **3.6 Index weighting**

The weight of the mineral group is the ratio of the estimated value of production of a mineral group to the total estimated value of production of the mining industry. The weight of a mineral group reflects the importance of the mineral group in the total mining industry. The relative importance of various mineral groups is different

and these differentials need to be reflected while measuring the performance of the entire mining sector.

### 3.7 Year-on year percentage change

Year-on-Year percentage change in a variable for any given period is the rate of change expressed over the same period (OECD, 2007).

### 3.8 Index Contribution (percentage points)

The contribution (percentage points) of a mineral group or mineral to the percentage change in the total mining production for a given period is calculated by multiplying the difference in the index for each mineral group or mineral by the weight of the mineral group or mineral and then dividing by the previous period's total index. It indicates the extent to which each mineral group affects the overall growth of mining production.

### 3.9 Calculation of the Index of Mining Production.

To calculate the evolution of physical volume of mining production on a quarterly basis, a Laspeyres indicator, base year 2013=100, was used. The index is calculated as the weighted arithmetic mean of the production relatives in respect of selected items. The weighted average is done to measure the importance of various mineral groups in the mining sector when calculating the comprehensive growth rate of the sector.

$$I = \frac{\sum R_i * W_i}{\sum W_i}$$

Where;  $I$  is the index,  $R_i$  is the production relative of item  $i$  and  $W_i$  is the weight allocated to item  $i$

The production relative ( $R_i$ ) of the  $i^{th}$  item for the quarter has been calculated by using the formula:

$$(R_i) = \frac{P_{ic}}{P_{io}} * 100$$

Where  $P_{ic}$  is the production of the  $i^{th}$  item in the current quarter and  $P_{io}$  is the production of the  $i^{th}$  item in the base year.